

On Two Asian Species of the Genus *Mellinus* Fabricius, 1790 (Hymenoptera: Crabronidae)

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Abstract.—*Mellinus obscurus* Handlirsch, 1888, currently recognized as a subspecies of *arvensis* (Linnaeus, 1758), is restored to full species status based on the unusual structure of its antennal socket. *Mellinus orientalis* is described from India and Nepal; its main diagnostic characters are a finely sculptured propodeal enclosure and a carina separating the propodeal posterior surface from the side.

The following are the abbreviations used in the text below:

CAS: California Academy of Sciences, San Francisco, California, USA
USAL: Área de Zoología, Facultad de Biología, Universidad de Salamanca, Spain
ZSI: Northern Regional Station, Zoological Survey of India, Dehradun, India.

Mellinus obscurus Handlirsch, species status restored

Mellinus obscurus Handlirsch, 1888:289, E. Holotype: E, Korea: no specific locality (KRA-KÖW). – Dalla Torre, 1897:561 (in catalog of world Sphecidae); Maidl and Klima, 1939:39 and 43 (in catalog of world Astatinae and Bembicinae); Yasumatsu, 1943:2 (China: Hebei Province, Inner Mongolia, description of Γ); Tsuneki, 1965:26 (in key to Bembicinae of Japan and Korea); Haneda, 1968:46 (Japan); Tano, 1968:33 (Japan); Tsuneki, 1969a:18 (Japan: Sapporo area: nesting habits, prey,); 1969b:26 (Japan: specimens in Osaka Muse-

um); Tsuneki, 1969c:64 (Japan: Mount Hyonosen); Nambu, 1973:152 (Japan: Saitama Prefecture); Suda, 1973:123 (Japan: Yamana-shi Prefecture); Siri and R. Bohart, 1974:170 (in key to world *Mellinus*), 174 (in review of world *Mellinus*); Nambu, 1975:72 (Japan: Saitama Prefecture); R. Bohart and Menke, 1976:449 (listed); Kazenas, 1980:84 (first record from Russia: Primorskiy Kray and Kuril Islands); Tsuneki, 1982:18 (known from Korea; as *obscurus*), 1982b:36 (first record from Taiwan: Chiay Prefecture: Mount Ali); Miyatake, 1996:103 (specimens in Hiroshi Aoki collection). – As *Mellinus arvensis obscurus*: Nemkov in Nemkov, Kazenas, Budrys, et Antropov, 1995:455 (new status, in key to Sphecidae of Russian Far East); Nemkov, 2005:157 (Russia: Sakhalin Island), 2006:169 (Russia: Primorskiy Kray: Kedrovaya Pad' Nature Reserve); nec Boesi, Polidori, Gayubo, Tormos, Asís, and Andrietti, 2007:184 (= *Mellinus orientalis*); Nemkov, 2007:74 (Russia: Kuril Islands: Iturup and Kunashir Islands), 2008:20 (in key to *Mellinus* of Russia). *Mellinus tristis* Pérez, 1905:156, E. Holotype or syntypes: E, Japan: no specific locality but presumably Tokyo area (MNHN). Synonymized with *Mellinus obscurus* by Tsuneki,

1965:26. – Pérez, 1905:26 (listed); Maidl and Klima, 1939:42 (in catalog of world Astatinae and Bembicinae); Tsuneki, 1946:85 (prey records). – As *Mellinus obscurus tristis*: Yasumatsu, 1943:3 (comparison with *Mellinus obscurus*); Maruyama, 1948:7 (nesting habits); Tsuneki and Shimoyama, 1963:48 (Japan: Towada Prefecture).

We have not seen the type of *Mellinus obscurus*, but there is little doubt about the interpretation of this species, as it is the only member of the genus that occurs in the Asian Far East. It was described as a full species, but differentiated from *arvensis* only by chromatic characters (Handlirsch, 1888; Siri and Bohart, 1974; Nemkov et al., 1995, 2008). In *arvensis* the mesopleuron, scutellum, gastral terga II, III and V (female) or VI (male) are marked with yellow, and the hindtibia is yellowish brown, whereas these body parts, except tergum III (and occasionally other terga), are black in *obscurus*. In addition, *arvensis* occurs in Europe, Turkey, Kazakhstan, and east to the Irkutsk area and Altai Mts. in Siberia, while *obscurus* is known from the Russian Far East, Korea, Japan, China (Hebei Province and Inner Mongolia), and Taiwan. Because the differences between *arvensis* and *obscurus* were in color only, and because they appeared to be vicariant species, Nemkov et al. (1995) downgraded *obscurus* to a subspecies of *arvensis*. *Mellinus obscurus*, however, strikingly differs from all its congeners in having the antennal socket with an overhanging frontal lobe (compare Figs 1a, b and 2a). In our opinion, this difference alone suffices to treat *obscurus* as a full species.

We have examined 7 ♀, 6 ♂ from Japan and 1 ♀ and 1 ♂ from Kuril Islands, Russia.

***Mellinus orientalis* Gupta, Gayubo, and Pulawski, sp. nov.**

Mellinus sp.: Gupta, 1997:102 (first record of *Mellinus* from Oriental Region).

As *Mellinus arvensis obscurus*: Boesi, Polidori, Gayubo, Tormos, Asís, and Andrietti,

2007:184 (Nepal; nesting habits, adult morphology, description of larva).

Name derivation.—*Orientalis*, a Latin masculine and feminine adjective meaning *Oriental*; with reference to this species distribution.

Taxonomic history.—Gupta (1997) first recorded *Mellinus* from the Oriental Region, but he determined his specimens to genus only. Boesi et al. (2007) examined 17 females from Nepal, comparing them to the European *Mellinus arvensis* and the Japanese *M. arvensis obscurus*. They discussed several sculptural, setal, and chromatic characters, but not the antennal socket nor the pygidial plate, and concluded that the Nepalese specimens were conspecific with *arvensis obscurus*. We consider all these specimens to represent a distinct new species, *Mellinus orientalis*.

Diagnosis.—As in the Palearctic *arvensis* (Linnaeus), *crabroneus* (Thunberg), *obscurus* Handlirsch, and also the Mesoamerican *costaricae* (Bohart) recently transferred to *Mellinus* from *Trachogorytes* by Pulawski (2007), *orientalis* has a well-defined carina that separates the propodeal posterior (oblique) surface from the side. It differs from these four species by five characters: 1. its propodeal enclosure is finely rugose on a narrow median zone (rather than conspicuously rugose on a large portion of the enclosure, compare Figs. 1c and 2b), 2. the gaster is all black or tergum III has a pair of lateral pale spots (at least tergum II has pale spots in the other four species), 3. the female pygidial plate is punctate over more than half its length and ridged only apically (rather than punctate basally and ridged over more than half of its length, compare Figs. 1e and 2d), 4. male flagellomeres VI–IX each has a narrow, almost linear placoid (rather than a broadly elliptical placoid; male unknown in *costaricae*), and 5. gonocoxite narrowed apically (rather than conspicuously broad (compare Fig. 1f and 2e). Also, the erect setae on tergum I are shorter in *orientalis* than in *arvensis* and *obscurus* (compare Figs. 1d and 2c).

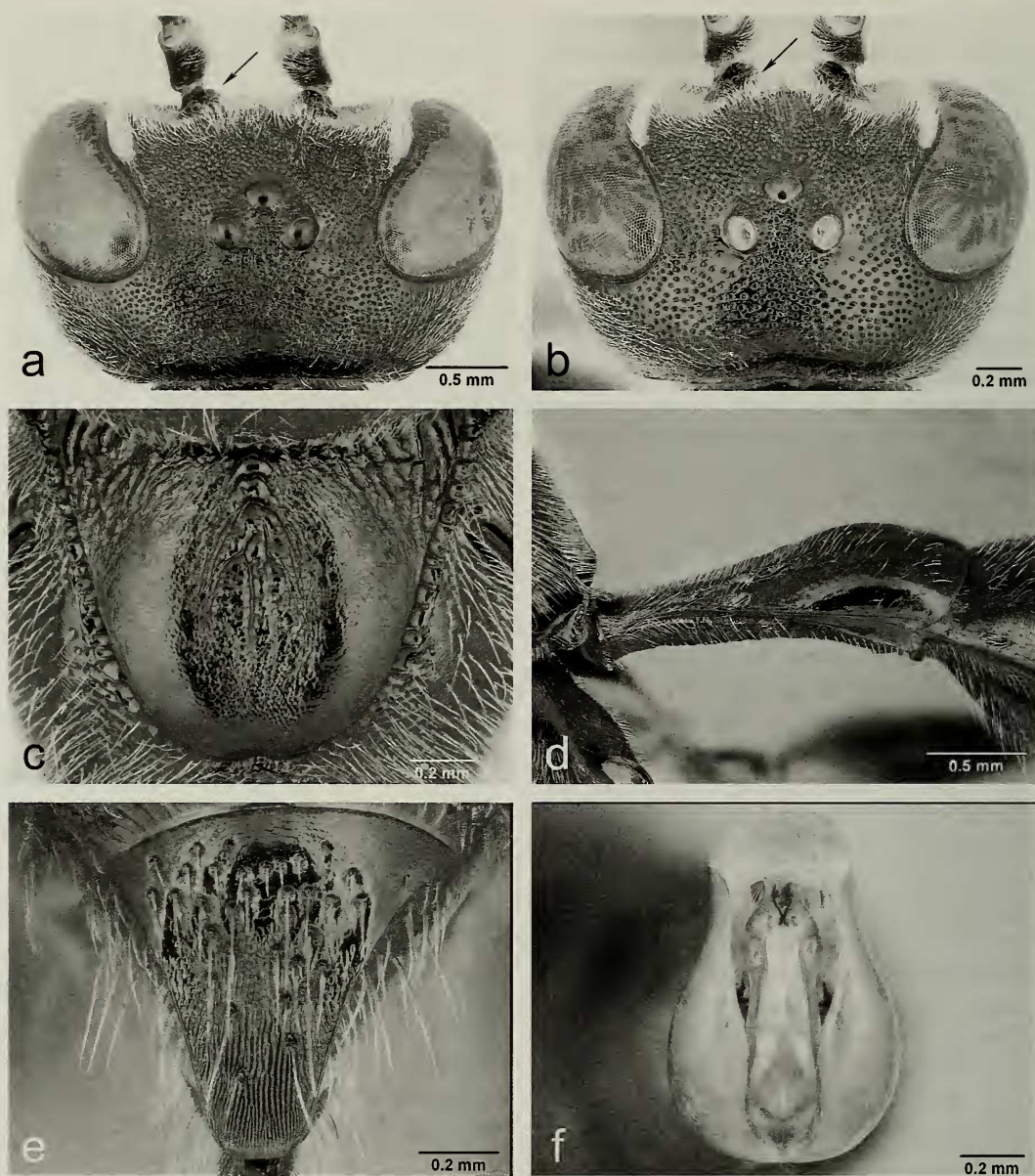


Fig. 1. *Mellinus obscurus* Handlirsch: a – female head in dorsal view showing antennal sockets; b – male head in dorsal view showing antennal sockets; c – propodeal enclosure of female; d – female tergum I in lateral view; e – pygidial plate of female; f – male genitalia in dorsal view.

Description.—Clypeal free margin with three well-defined teeth. Tentorial pit closer to antennal socket than to inner eye orbit (0.7:1.0) in female, equidistant in male. Frontal and scutal punctation slightly finer than in *arvensis*. Mesopleuron punctate. Propodeal enclosure microscopically areolate and with finely rugose

median area (Fig. 2b) that is slightly narrower than midocellar width (the rugose area is no longer than midocellar width in some specimens, and extends to about enclosure midlength in others); propodeal side punctate, unsculptured anteriorly, separated from posterior (oblique) surface by longitudinal carina

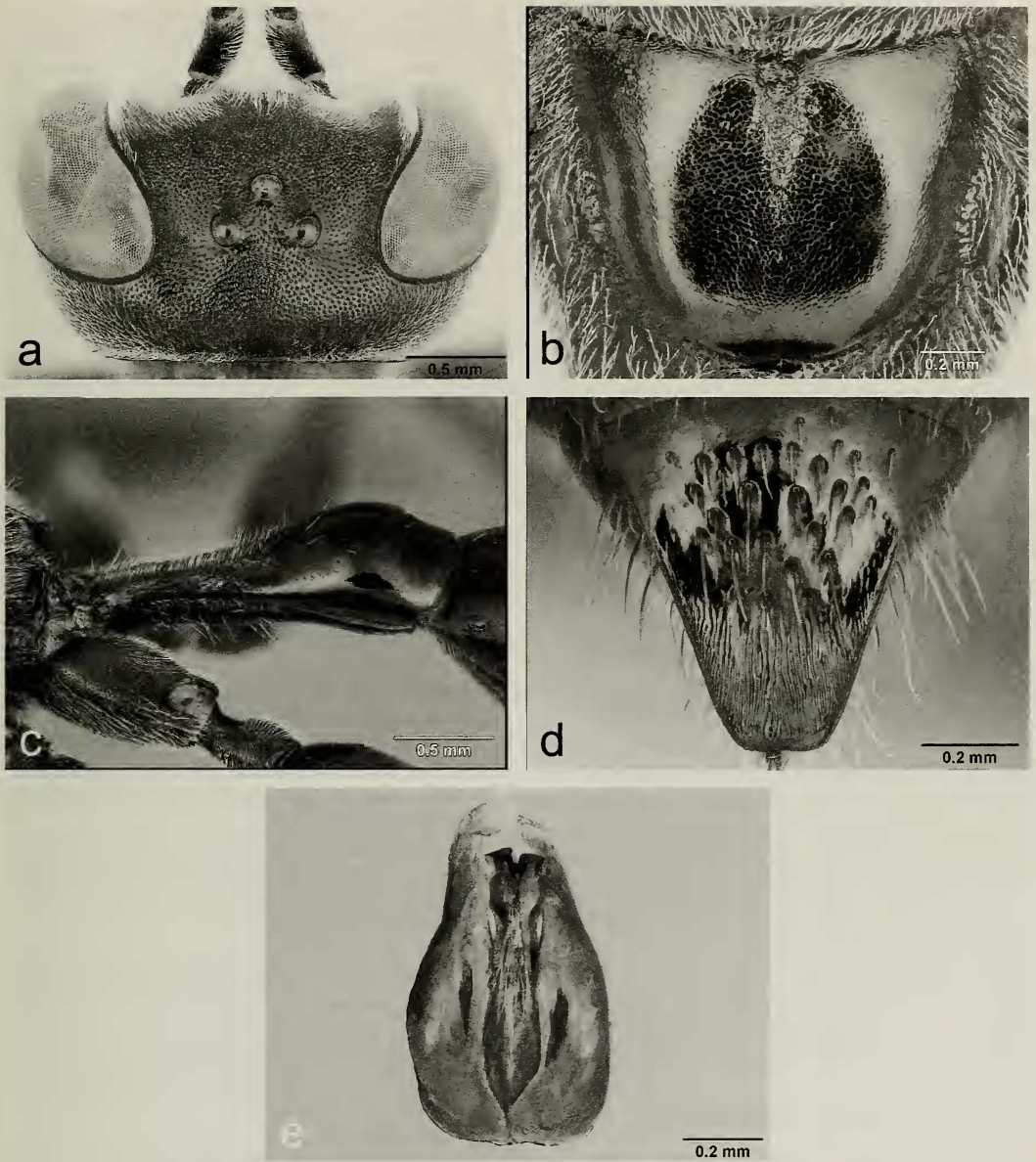


Fig. 2. *Mellinus orientalis* Gupta, Gayubo, and Pulawski: a – female head in dorsal view showing antennal sockets; b – propodeal enclosure of female; c – female tergum I in lateral view; d – pygidial plate of female; e – male genitalia in dorsal view.

that starts about two midocellar widths behind propodeal spiracle; posterior surface punctured. Tergum I narrow, its maximum width $2.0 \times$ basal width (measured just behind gastro-propodeal articulation) in female, $1.7 \times$ in male.

Setae erect on dorsum of peduncle of tergum I, markedly shorter than those on

sternum I (setal length about $0.5 \times$ mid-ocellar width, Fig. 2c).

Head, thorax, propodeum, and gaster black except the following are pale yellow: narrow paraorbital stripe (extending to about orbit midheight), scapal venter, ventral half of clypeus in Nepalese specimens (clypeus all black in Indian male and

with two admedian and two small lateral spots in Indian female), and pair of spots on pronotal collar in some Nepalese specimens. Legs black except inner fore-tibial surface pale yellow in Nepalese specimens, partly yellowish brown in Indian female, and dark brown in Indian male; and apical tarsomeres yellowish brown to brown. Tergum III with pair of lateral pale spots in most Nepalese specimens (all black in two).

♀. – Pygidial plate punctate over more than half its length, ridged on remaining apical portion (Fig. 2d). Length: 9.5–12.0 mm.

♂. – Flagellomeres VI–IX each with narrow, almost linear placoid. Genitalia: Fig. 2e. Length 7.5 mm.

Geographic distribution.—Northern India, Nepal.

Records. —HOLOTYPE: ♀, **INDIA: Uttarakhand:** Dwali in Almora District, 2734 m, 31 Aug 1990, P.C. Tak & party (ZSI: NRS/ZSI/A9837). PARATYPES: **INDIA: Himachal Pradesh:** Dalhousie, 2132 m, 17 Aug 1972, Gulati (1 ♂, ZSI: NRS/ZSI/A9838); Narkanda [ca 2700 m], 21 June 1972, Mayank (1 ♂, CAS). **Uttarakhand:** between Dwali and Phurkia in Almora District, 2,734–3,260 m, 1 Sept 1990, P.C. Tak & party (1 ♀, CAS). **NEPAL: Eastern Region:** Solu Khumbu District: Sagarmatha National Park at 27°45′–28°07′N 86°28′–87°07′E, Roberto Boesi, 30 May 2003 (1 ♀, USAL); 26 June 2003 (2 ♀, CAS; 3 ♀, USAL), 30 June 2003 (1 ♀, USAL), 6 July 2003 (7 ♀, USAL); 10 July 2003 (1 ♀, CAS; 2 ♀, USAL).

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